



Dart Aerospace Ltd.
1270 Aberdeen St
Hawkesbury, ON
K6A 1K7
Canada

Tel (613) 632-5200
Fax 613 632-5246

RB T101808-107-PO

Job Sheet 185195



Part No: RB T101808-107-PO

Job Qty: 1 ea

Part Name: Tube Assembly



Part Weight: 0 lbs

Status: New

Priority: Medium

Job Created: 10/23/18

Job Tracking No:

Due Date: 11/29/18

Created By: Patrick Lussier

Type: Stock

Description:

Note: DWG T101808 Rev 0, IPP Rev. A 18.10.18 Now outsource DP Verify DD

Ship Via:

DAS
03
8-28

4

Bill of Materials

Job Routing

Op No	Operation	Qty	Start Date	Due Date	Standard		Workcenter/Supplier		Sign-off
					Setup Hrs	Run Hrs	Workcenter / Supplier	Lead Time	
100	Purchasing	1 pcs		11/29/18	0.00	0.00	Purchasing		NOV 21 2018
110	Packaging	1 pcs		11/29/18	0.00	0.00	Packaging2		NOV 21 2018 AS
120	QC	1 pcs		11/29/18	0.00	0.00	QC6		NOV 22 2018 68
130	Small Fab	1 pcs		11/29/18	0.00	0.10	Small Fab-2		9-89
140	QC	1 pcs		11/29/18	0.00	0.00	QC5		
150	Packaging	1 pcs		11/29/18	0.00	0.00	Packaging3		
160	QC21-FG	1 Ea		11/29/18	0.00	0.00	QC21		NOV 28 2018

Part Op 100 - Issue P/O: 041428 MANUFACTURE RB T101808-107 AS PER DWG Supplier: AIRCRAFT HARDWARE
Descriptions: ACCESS - Certificate of conformity is required
130 - Re-identify as required.

oct 23 - 2018 x 1 flh

Mutec PL

Job BOM

Part / Item	Component Name	Quantity	Operation	Container
RB T101808-107P	Tube Assembly	1 (1 ea)	100-Purchasing	5129949

Job Allocations

Operation	Component Part	Required	Inventory	Allocated
100-Purchasing	RB T101808-107P	1	0	0

Part Specifications



Dart Aerospace Ltd.
1270 Aberdeen Street
Hawkesbury, ON K6A 1K7
CANADA
TEL.: 1 613 632-5200
Email: sales@dartaero.com
www.dartaerospace.com

Container No: S129954



Part: RB T101808 - 107

Job No: 185195

Serial No/Batch: S129954

Revision: 0

Inspector:

Exp Date:

Instructions:

Date: 11/21/18

could not be found.

Plex 10/23/18 3:42 PM dart.Lussier.Patrick



88

NOV 3 1968
88
88-8

NOV 3 1968

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NOV 3 1968



Dart Aerospace Ltd.
1270 Aberdeen St
Hawkesbury, ON
K6A 1K7
Canada

Tel (613) 632-5200

PURCHASE ORDER **PO041428**

Supplier: MEM001-VC
Metec Metal Technology Inc.
20 Terry Fox Drive PO Box 781
Vankleek Hill
ON
K0B 1R0 Canada
Phone: 613 678 3957
Fax: 613 678 3956

Attention: Walz, Shigi

Ship To: 1270 Aberdeen Street
Hawkesbury
ON
K6A 1K7 Canada
Phone: 613-632-5200

PO No: PO041428
PO Date: 10/23/18
Due Date: 11/29/18
Purchase Order
Revision:
Revision Date:
Ship-To Contact: Lussier, PatrickPhone:

Via: Ground
Pymt Terms: Net 60

Freight Terms:
Special Comments:

Revised

Items

Line Item	Job	Part	Supplier Part No	Item No	Description	Status	Account	Due Date	Order Quantity	Received Quantity	Balance	Unit Price (CAD)	Extended Price
1	185195	RB T101808- 107P			Tube Assembly REV 4	Firmed	-	11/29/18	1 Ea	0 Ea	1 Ea	\$797.50/Ea	\$797.50
												Grand Total:	\$797.50

Order Notes

Procurement Quality Clauses
A005 RIGHT OF ENTRY
A008 FIRST ARTICLE INSPECTION (FAI) BY SELLER, (DOCUMENTATION SENT TO DART AEROSPACE)
A012 CHEMICAL AND PHYSICAL TEST REPORTS
A016 PERSONNEL QUALIFICATION
A017 RAW MATERIAL IDENTIFICATION (AS APPLICABLE)
A026 CERTIFICATION OF MATERIAL CONFORMANCE
A041 QUALITY MANAGEMENT SYSTEM
A042 DART NOTIFICATION BY SUPPLIER
A043 RETENTION OF QUALITY DOCUMENT

A048 COUNTERFEIT PARTS AVOIDANCE, DETECTION, MITIGATION AND DISPOSITION PROGRAM

A049 SUPPLIER AWARENESS

Terms & Condition of Purchasing(Suppliers) and Procurement Quality Clauses are an integral part of our AS9100 requirements. To learn in detail, please visit www.dartaerospace.com for further explanation.

Plex 11/21/18 9:31 AM dart.Lussier.Patrick

Packing List

Bill Dart Aerospace Ltd.
To: 1270 Aberdeen Street
Hawkesbury, ON K6A 1K7
Canada

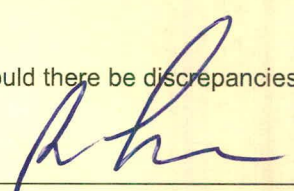
Ship Dart Aerospace Ltd.
To: 1270 Aberdeen Street
Hawkesbury, ON K6A 1K7
Canada

Shipment No: 24258
Shipment Date: 20-Nov-2018
Ship Via: our truck
Order Number: 3124
Order Date: 10/25/18

Customer Code: DART
Phone: (613) 632-9577
PO Number: PO041428 ✓
Terms: Net 60 Days

----- Quantity -----								Job
<u>Item</u>	<u>Open</u>	<u>Shipped</u>	<u>B/O</u>	<u>Canceled</u>	<u>Unit</u>	<u>Description</u>	<u>Revision</u>	<u>Number</u>
1	1	1	0	0	EA	DART-RB-T101808-107P Tube Assembly	4	3124-01

The delivered goods must be inspected upon receipt to confirm compliance. Should there be discrepancies please notify METEC within 30 days of delivery. The goods are otherwise deemed accepted.


Received In Good Order By



20 Terry Fox Drive, Vankleek Hill, Ontario K0B 1R0

Tel. (613) 678-3957 & (613) 678-2782 Fax (613) 678-3956 metec@metec.ca

CERTIFICATE OF CONFORMITY

SOLD TO:

Dart Aerospace Ltd.
1270 Aberdeen Street
Hawkesbury, Ont.
K6A 1K7

SHIPPED TO:

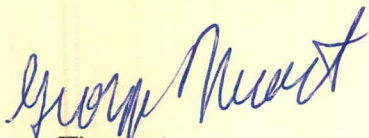
same

Quantity	Part Number	Part Name	Dwg Rev.#	P.O. Number
1	DART-RB-T101808-107P	Tube Assembly	4	41428

MATERIAL: supplied by METEC

We hereby certify that the above parts were made in conformance with applicable drawings.

METEC Metal Technology Inc.


George Theoret

Vankleek Hill, November 20, 2018

[illegible][illegible]

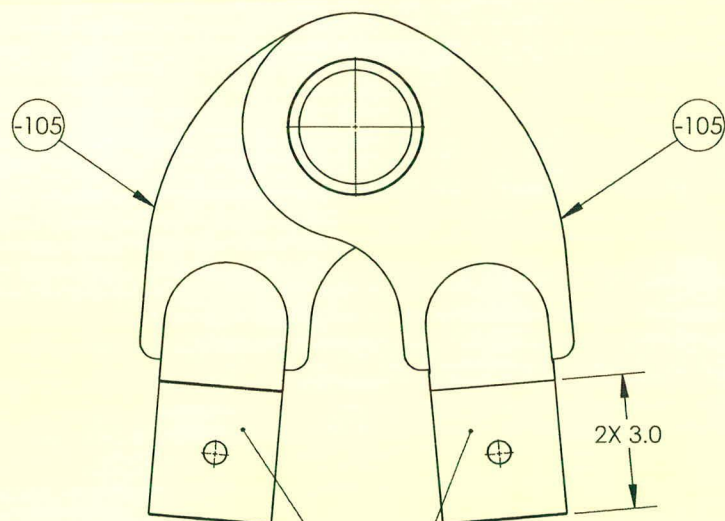
ASSY QTY	ASSY QTY	ASSY QTY	B/O	Part #	UNIT QTY	Description	Material	B/O INFORMATION OR SPECIFICATIONS	PG
		X		-103	1	PIVOT ASSY.			2
	X	2		-105		LEG ASSY.			3
				-107	2	TUBE ASSY.			4
				-113	2	WHEEL BUSHING	STEEL	[INCLUDED WITH -153] MODIFIED	2
				-115	2	HOOK	304 S.S.		6
	1			-117		PLATE	A36/1018/1020 HR		7
	1			-119		LEG TUBE	STEEL	[KOCH METAL SPINNING OR AIRCRAFT HARDWARE, NO HOLES PREFERRED] MODIFIED	8
			1	-121		COLLAR	A36/1018/1020 HR		9
1				-123		PLUG	6061		10
				-127	2	HANDLE	304 S.S.		11
1				-129		INNER TUBE	6061		12
				-131	2	OUTER TUBE	6061		13
				-133	1	WHEEL BLOCK	6061		14
				-134	1	WHEEL BLOCK	6061		15
				-135	2	PIN	303 S.S.		16
			B/O	-137	12	WASHER	STEEL	Ø 1/2 (MCMaster-CARR #90126A033)	1
			B/O	-139	6	NYLON-INSERT LOCKNUT	STEEL	1/2-20, GRADE 5 (MCMaster-CARR #95615A220)	1
			B/O	-141	16	WASHER	STEEL	3/8 (MCMaster-CARR #90108A417)	1
			B/O	-143	8	NYLON-INSERT LOCKNUT	STEEL	3/8-24, GRADE 5 (MCMaster-CARR #95615A150)	1
			B/O	-145	2	DRIVE SCREW	COATED STEEL	#8 X 1/4 (MCMaster-CARR #90081A190)	1
			B/O	-147	2	SET SCREW	S.S.	1/4-26 X 3/8 (MCMaster-CARR #92311A558)	1
			B/O	-149	2	LANYARD	COATED STEEL	Ø11/16 X 8 (CARR LANE #CL-2-C)	N
			B/O	-150	4	FERRULE	ALUMINUM	Ø11/16 X 3/8 (MCMaster-CARR #38967A31)	N
			B/O	-151	2	BALL LOCK PIN	STEEL	[CARR-LANE #CL-6-BLPL-3.5]	1
			B/O	-153	2	CASTER		[GALFICO #WR7205]	1
			B/O	-155	2	SPRING	S.S.	[LEE SPRING #LC-042G-12-S316]	1
			B/O	-157	8	BOLT	STEEL	3/8-24 X 2-1/2, GRADE 5 (MCMaster-CARR #91247A227)	1
			B/O	-159	4	BOLT	STEEL	1/2-20 X 4-1/2, GRADE 5 (MCMaster-CARR #91247A366)	1
			B/O	-161	2	BOLT	STEEL	1/2-20 X 4, GRADE 5 (MCMaster-CARR #91247A364)	1
			B/O	-165	1	SHIPPING CRATE		[SPECIALTY CRATE "TOW BAR CRATE" (92x14x6.5)]	N
			B/O	-167	2	LANYARD TAB	ALUMINUM	#10 [CARR-LANE #CL-194-TAB-A]	1
			B/O		1	DART FLACARD	ALUMINUM	#RB4101	1

1. REF: BELL T/N: T101808
2. COMMERCIALLY AVAILABLE EQUIVALENT MATERIAL MAY BE SUBSTITUTED FOR EASE OF MANUFACTURING.

		TITLE	
		UNIVERSAL HELICOPTER TOW BAR ASSY.	
DWP NO.		REV	
RB T101808-101		4	
MATL. REAT FINISH SPEC		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES FRACTIONS & 10 .XX ± .01 ANGLES ±.5° .1 ± .01 SURFACES = 125/	
DRAWN BY: CLOUGH CHECKED: DUFFERLDT OPSS APPR: ANDERSON QA APPR: LINDSAY APPROVED: GILBERT		1. BREAK ALL SHARP EDGES .015 ± .01 OR .015R 2. DIMENSIONAL LIMITS APPLY AFTER PLATING 3. INTERPRET DIM AND TOL PER ASME Y14.5-2009 USED ON MODEL BELL	
SCALE	1:18	DATE	2/18/2014
		SHEET 1 OF 16	

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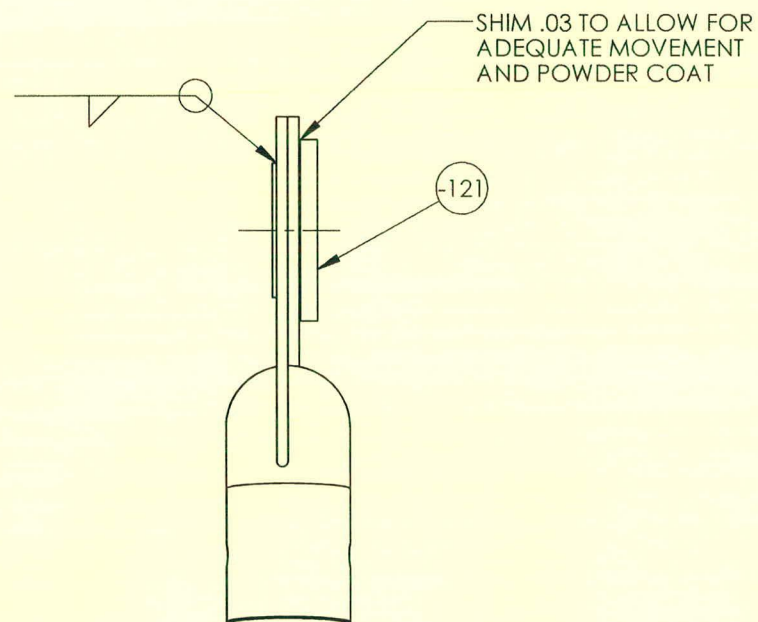
REVISIONS				DATE	INITIAL	APPROVED
REV	ECR	DESCRIPTION				
2	15-0026	-103 ADDED SHIM NOTE.				



NO POWDER
COAT THIS AREA

-103

PIVOT ASSY



TITLE
UNIVERSAL HELICOPTER TOW BAR ASSY

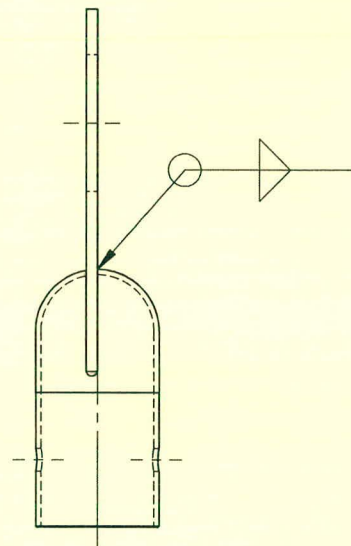
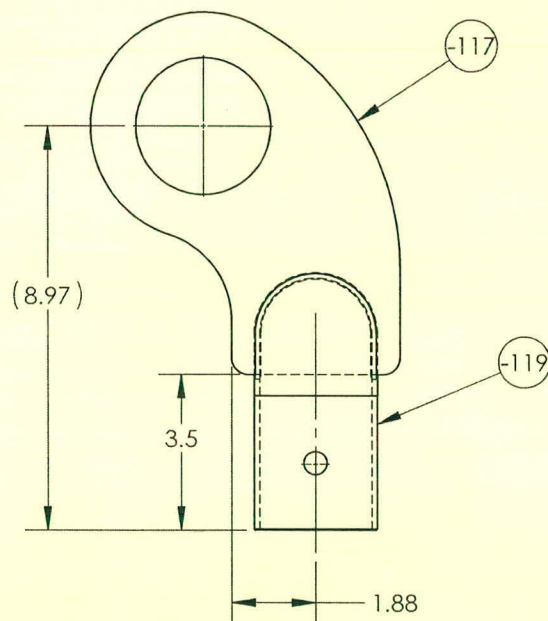
DWG NO. RB T101808-103

REV
4

MAT'L		UNLESS OTHERWISE SPECIFIED	
HEAT TREAT		DIMENSIONS ARE IN INCHES	
FINISH POWDER COAT YELLOW		.XXX ± .010	FRACTIONS ± 1/8
SPEC FED #13538		.XX ± .03	ANGLES ± 1°
DRAWN BY: GILBERT		.X ± .1	SURFACES = 125/√
CHECKED: DUERFELDT		1. BREAK ALL SHARP EDGES	
OPPS APPR: ANDERSON		.015 x 45° OR .015R	
QA APPR: LINDSAY		2. DIMENSIONAL LIMITS APPLY	
APPROVED: GILBERT		AFTER PLATING	
SCALE 1:4		3. INTERPRET DIM AND TOL PER ASME Y14.5M-2009	
DATE 2/19/2014		USED ON MODEL	
		BELL	
		SHEET 2 OF 16	

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REVISIONS			
REV	ECR	DESCRIPTION	DATE INITIAL APPROVED



-105

LEG ASSY



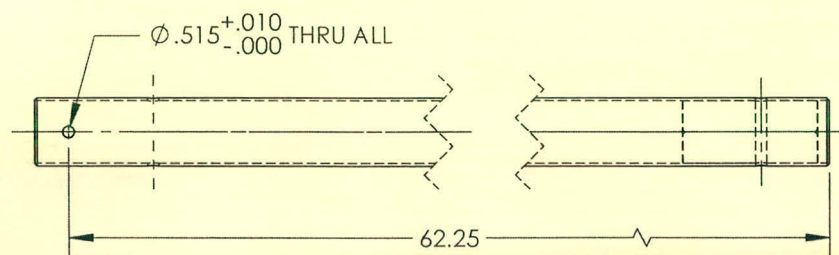
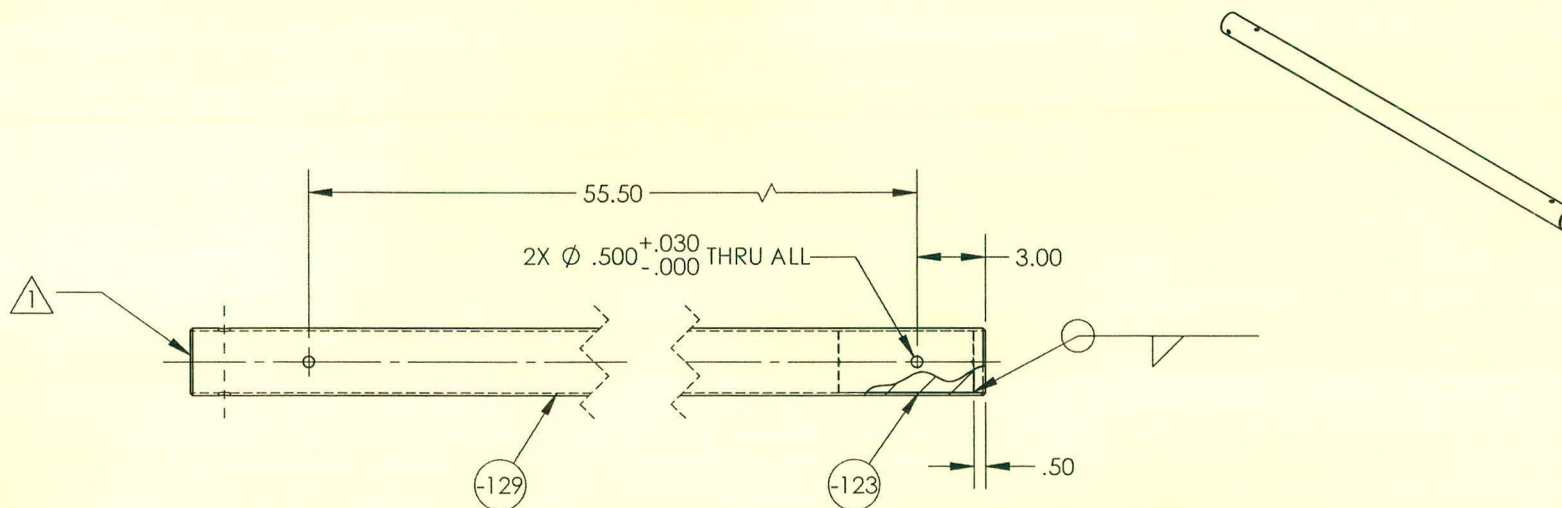
TITLE
UNIVERSAL HELICOPTER TOW BAR ASSY.

DWG NO. RB T101808-105 REV 4

MATERIAL		UNLESS OTHERWISE SPECIFIED	
HEAT TREAT		DIMENSIONS ARE IN INCHES	
FINISH SEE -103		.XXX ± .010	FRACTIONS ± 1/8
SPEC		.XX ± .03	ANGLES ± 1°
		.X ± .1	SURFACES = 125/
DRAWN BY: GILBERT		1. BREAK ALL SHARP EDGES	
CHECKED: DUERFELDT		.015 x 45° OR .015R	
OPPS APPR: ANDERSON		2. DIMENSIONAL LIMITS APPLY	
QA APPR: LINDSAY		AFTER PLATING	
APPROVED: GILBERT		3. INTERPRET DIM AND TOL PER	
		ASME Y14.5M-2009	
		USED ON MODEL	
		BELL	
SCALE	1:4	DATE	2/18/2014
		SHEET 3 OF 16	

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REVISIONS							
REV	ECR	DESCRIPTION			DATE	INITIAL	APPROVED
3	16-0041	-107 ADDED DIMENSIONS 5.25, 1.49-1.50, Ø.515 +.010-.000 THRU ALL, CH'D DIM WAS Ø.500 +.030-.000 THRU ALL IS 2X Ø.500 +.030-.000 THRU ALL. ADDED NOTE Δ.			2/18/2016	RJC	JAG
4	16-0131	-107 REMOVED DIMS 5.25 AND 1.50-1.49, ADDED DIMS 55.50 AND 62.25.			8/29/2016	DEW	SM



NOTE:

$\triangle$ 1 MASK OFF I.D. 3" MIN PRIOR TO POWDER COATING.



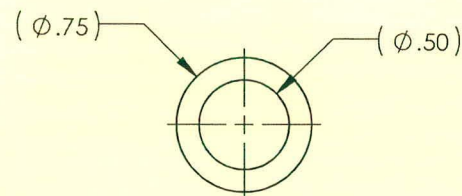
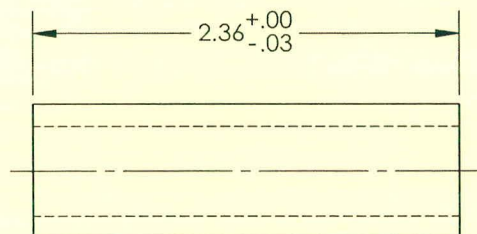
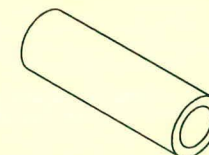
TITLE			UNIVERSAL HELICOPTER TOW BAR ASSY.		
DWG NO.			RB T101808-107		
REV			4		
MAT'L			UNLESS OTHERWISE SPECIFIED		
HEAT TREAT			DIMENSIONS ARE IN INCHES		
FINISH			.XXX $\pm$.010 FRACTIONS $\pm$ 1/8		
SPEC			.XX $\pm$.03 ANGLES $\pm$ 1°		
DRAWN BY:			.X $\pm$.1 SURFACES = 125/		
CHECKED:			1. BREAK ALL SHARP EDGES		
OPPS APPR:			.015 x 45° OR .015R		
QA APPR:			2. DIMENSIONAL LIMITS APPLY		
APPROVED:			AFTER PLATING		
SCALE			3. INTERPRET DIM AND TOL PER ASME Y14.5M-2009		
DATE			USED ON MODEL		
SHEET 4 OF 16			BELL		

-107

TUBE ASSY.

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REVISIONS				DATE	INITIAL	APPROVED
REV	ECR	DESCRIPTION				
3	16-0041	-113 DELETED (.125) ADDED (.50) DIMS.				
			2/18/2016	RJC	JAG	



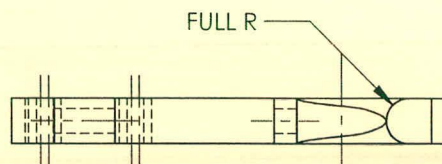
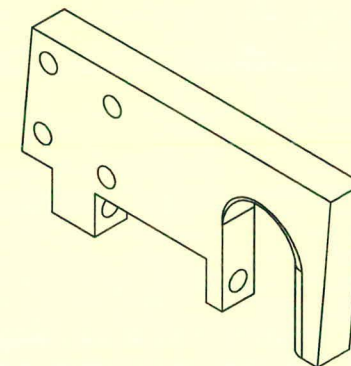
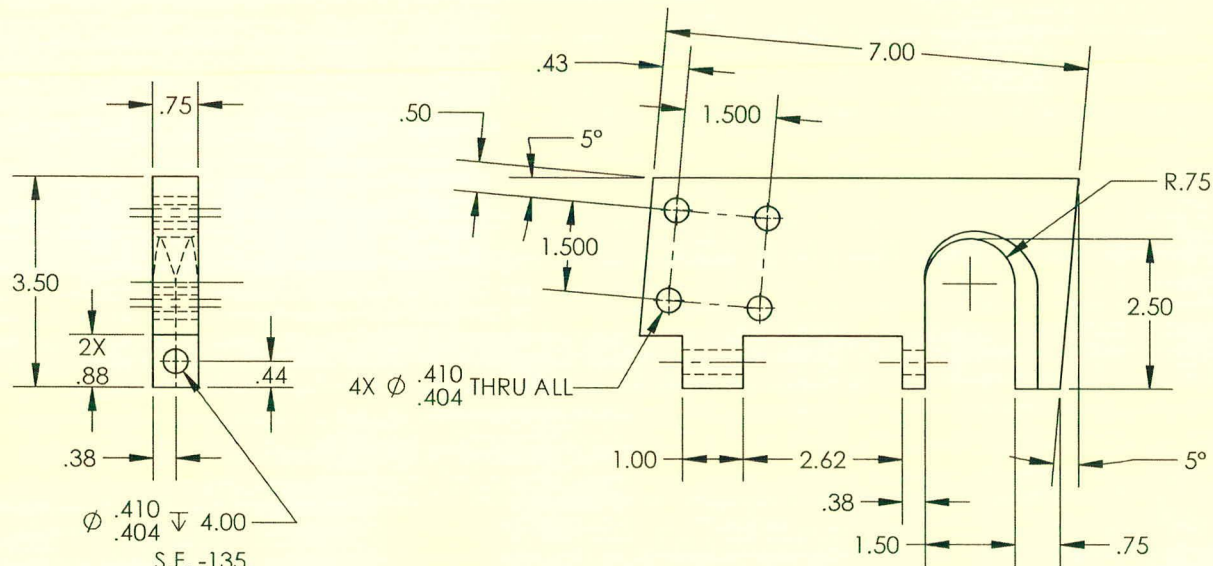
(-113)

WHEEL BUSHING

DART AEROSPACE	
TITLE UNIVERSAL HELICOPTER TOW BAR ASSY.	
DWG NO. RB T101808-113	REV 4
MAT'L STEEL	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
HEAT TREAT	.XXX ± .010 FRACTIONS ± 1/8
FINISH	.XX ± .03 ANGLES ± 1°
SPEC	.X ± .1 SURFACES = 125/✓
DRAWN BY: DUERFELDT	1. BREAK ALL SHARP EDGES .015 x 45° OR .015R
CHECKED: DUERFELDT	2. DIMENSIONAL LIMITS APPLY AFTER PLATING
OPPS APPR: ANDERSON	3. INTERPRET DIM AND TOL PER ASME Y14.5M-2009
QA APPR: LINDSAY	USED ON MODEL
APPROVED: GILBERT	BELL
SCALE 1:1	DATE 10/20/2014
SHEET 5 OF 16	

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REVISIONS				DATE	INITIAL	APPROVED
REV	ECR	DESCRIPTION				
1	14-0194	-115 CH'D DIM WAS .75 IS (.75).			10/20/2014	DPD JAG
3	16-0041	-115 CH'D DIMS WAS (.75) IS .75. WAS Ø.404-.410 ∇ 4.00 IS Ø.404-.410 ∇ 4.00 S.F. -135.			2/18/2016	RJC JAG
4	16-0131	-115 CH'D DIM WAS Ø.410/.404 ∇ 4.00 S.F. -135 IS Ø.410/.404 ∇ 4.00 (S.F. -135).			8/29/2016	DEW SM

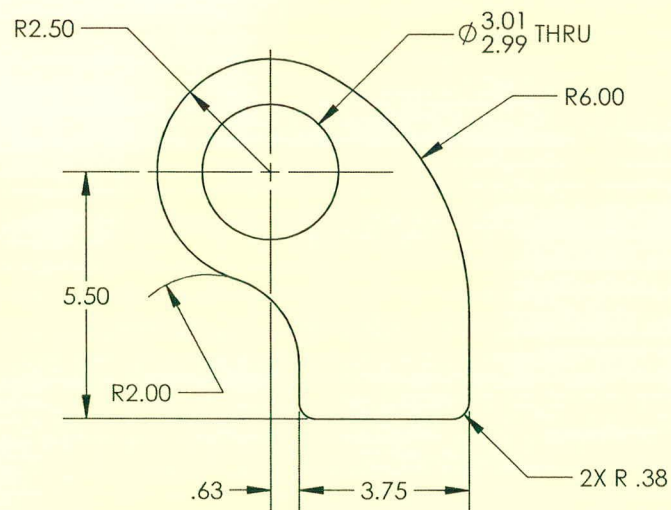


-115
HOOK

DART AEROSPACE	
TITLE UNIVERSAL HELICOPTER TOW BAR ASSY.	
DWG NO. RB T101808-115	REV 4
MATERIAL 304 S.S.	
HEAT TREAT	
FINISH	
SPEC	
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES .XXX ± .010 FRACTIONS ± 1/8 .XX ± .03 ANGLES ± 1° .X ± .1 SURFACES = 125/✓	
1. BREAK ALL SHARP EDGES .015 x 45° OR .015R	
2. DIMENSIONAL LIMITS APPLY AFTER PLATING	
3. INTERPRET DIM AND TOL PER ASME Y14.5M-2009	
DRAWN BY: CLOUGH	USED ON MODEL
CHECKED: DUERFELDT	BELL
OPPS APPR: ANDERSON	
QA APPR: LINDSAY	
APPROVED: GILBERT	
SCALE 1:3	DATE 2/18/2014
SHEET 6 OF 16	

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REVISIONS				DATE	INITIAL	APPROVED
REV	ECR	DESCRIPTION				
3	16-0041	-117 CH'D MATERIAL WAS HR P&O IS A36/1018/1020 HR. CH'D DIMS WAS (.25) IS .237-.250, WAS Ø3.00 IS Ø2.99-3.01.		2/18/2016	RJC	JAG

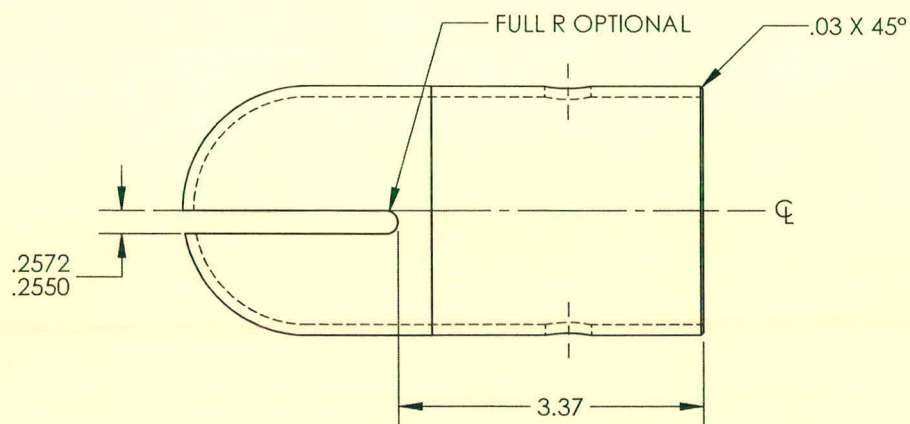
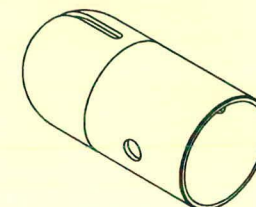
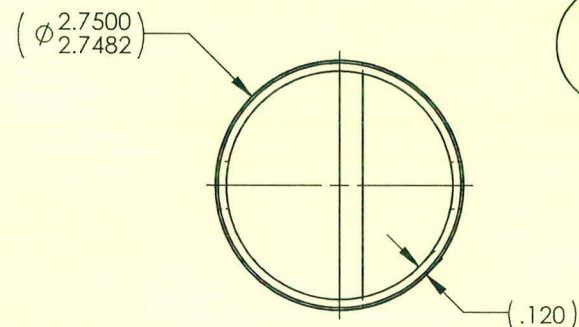
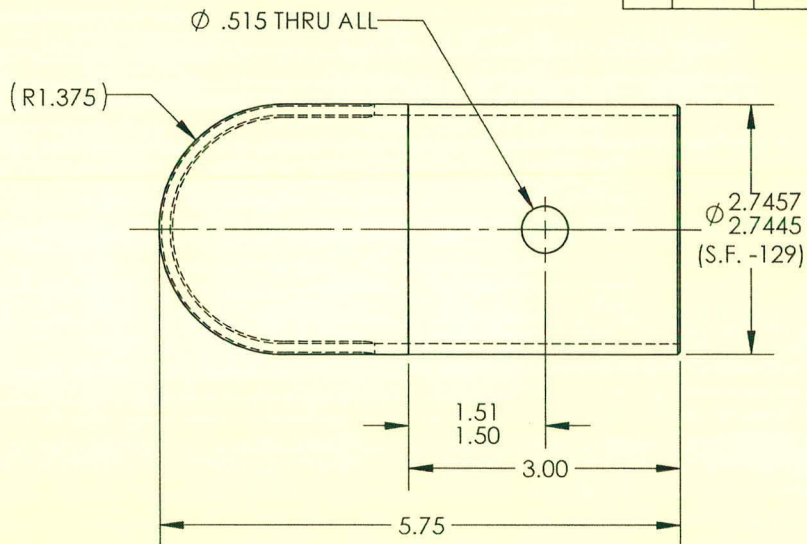


(-117)
PLATE

DART AEROSPACE	
TITLE UNIVERSAL HELICOPTER TOW BAR ASSY.	
DWG NO. RB T101808-117	REV 4
MAT'L A36/1018/1020 HR	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
HEAT TREAT	.XXX ± .010 FRACTIONS ± 1/8
FINISH SEE -105	.XX ± .03 ANGLES ± 1°
SPEC	.X ± .1 SURFACES = 125 ✓
DRAWN BY: GILBERT	1. BREAK ALL SHARP EDGES .015 x 45° OR .015R
CHECKED: DUERFELDT	2. DIMENSIONAL LIMITS APPLY AFTER PLATING
OPPS APPR: ANDERSON	3. INTERPRET DIM AND TOL PER ASME Y14.5M-2009
QA APPR: LINDSAY	USED ON MODEL
APPROVED: GILBERT	BELL
SCALE 1:4	DATE 2/18/2014
SHEET 7 OF 16	

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REVISIONS					
REV	ECR	DESCRIPTION	DATE	INITIAL	APPROVED
1	14-0194	-119 ADDED DIM (Ø2.75) S.F. -129.	10/20/2014		
2	15-0026	-119 CH'D DIM WAS 3.50 IS 3.38. ADDED FULL R TO SLOT.	1/30/2015	DPD	JAG
3	16-0041	-119 CH'D CALLOUT WAS FULL R IS FULL R OPTIONAL. CH'D DIMS WAS .25 S.F. -117 IS .2572-.2550. WAS (Ø2.75) S.F. -129 IS Ø2.7457-2.7445 S.F. -129. WAS 1.50 IS 1.50-1.51.	2/18/2016	RJC	JAG
4	16-0131	-119 CH'D DIM WAS Ø2.7457/2.7445 S.F. -129 IS Ø2.7457/2.7445 (S.F. -129).	8/29/2016	DEW	SM



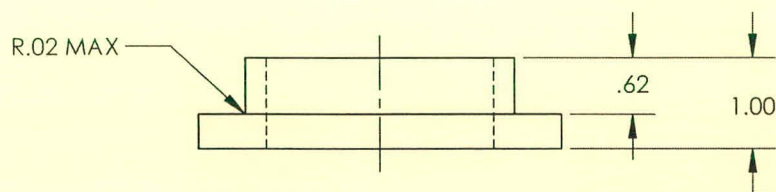
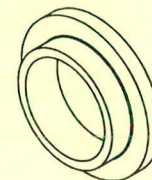
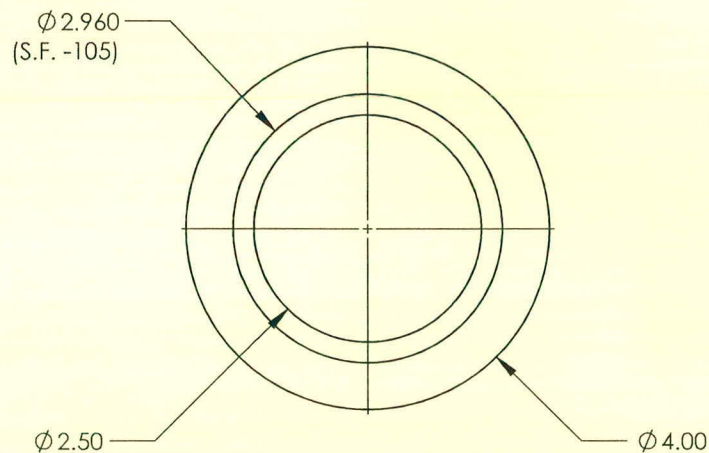
-119

LEG TUBE

DART AEROSPACE	
TITLE UNIVERSAL HELICOPTER TOW BAR ASSY.	
DWG NO. RB T101808-119	REV 4
MATERIAL STEEL	
HEAT TREAT FINISH SEE -105	
SPEC	
DRAWN BY: GILBERT	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES .XXX ± .010 FRACTIONS ± 1/8 .XX ± .03 ANGLES ± 1° .X ± .1 SURFACES = 125/✓
CHECKED: DUERFELDT	1. BREAK ALL SHARP EDGES .015 X 45° OR .015R
OPPS APPR: ANDERSON	2. DIMENSIONAL LIMITS APPLY AFTER PLATING
QA APPR: LINDSAY	3. INTERPRET DIM AND TOL PER ASME Y14.5M-2009
APPROVED: GILBERT	USED ON MODEL BELL
SCALE 1:2	DATE 2/18/2014
SHEET 8 OF 16	

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REVISIONS					
REV	ECR	DESCRIPTION	DATE	INITIAL	APPROVED
1	14-0194	-121 CH'D DIMS WAS Ø4.00 IS (Ø4.00).	10/20/2014	DPD	JAG
3	16-0041	-121 CH'D MAT'L WAS ASTM A513 IS A36/1018/1020 HR. CH'D DIM WAS (Ø4.00) IS 4.00.	2/18/2016	RJC	JAG
4	16-0131	-121 CH'D DIM WAS Ø2.960 S.F. -105 IS Ø2.960 (S.F. -105).	8/29/2016	DEW	SM



(-121)

COLLAR



TITLE
UNIVERSAL HELICOPTER TOW BAR ASSY.

DWG NO. RB T101808-121

REV
4

MAT'L A36/1018/1020 HR

HEAT
TREAT
FINISH SEE -103

SPEC

DRAWN BY: CLOUGH

CHECKED: DUERFELDT

OPPS APPR: ANDERSON

QA APPR: LINDSAY

APPROVED: GILBERT

SCALE 1:2

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
.XXX ± .010 FRACTIONS ± 1/8
.XX ± .03 ANGLES ± 1°
.X ± .1 SURFACES = 125/

1. BREAK ALL SHARP EDGES
.015 x 45° OR .015R
2. DIMENSIONAL LIMITS APPLY
AFTER PLATING
3. INTERPRET DIM AND TOL PER
ASME Y14.5M-2009

USED ON MODEL

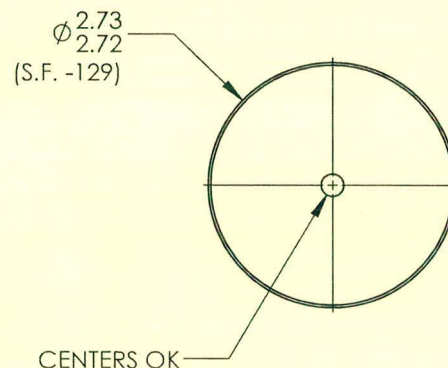
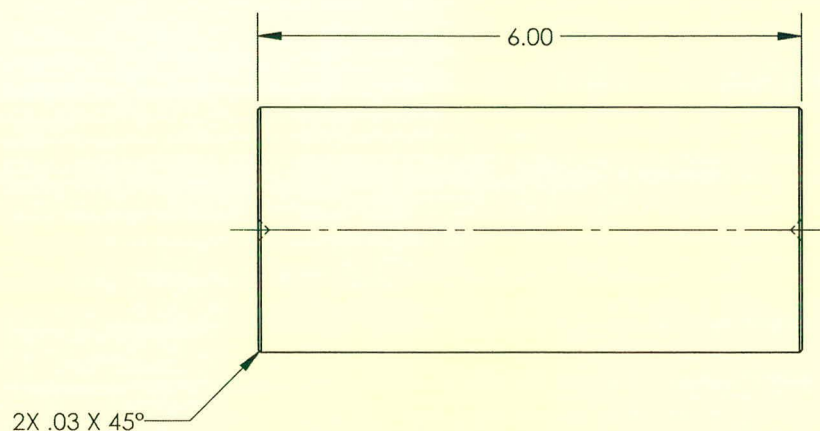
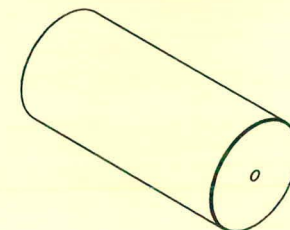
BELL

DATE 2/18/2014

SHEET 9 OF 16

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REVISIONS					
REV	ECR	DESCRIPTION	DATE	INITIAL	APPROVED
2	15-0026	-123 CH'D DIM WAS Ø2.738 IS (Ø2.738) S.F. -129.	1/30/2015	DPD	JAG
3	16-0041	-123 CH'D DIM WAS (Ø2.738) S.F. -129 IS Ø2.72-2.73 S.F. -129.	2/18/2016	RJC	JAG
4	16-0131	-123 CH'D DIM WAS Ø2.73/2.72 S.F. -129 IS Ø2.73/2.72 (S.F. -129).	8/29/2016	DEW	SM



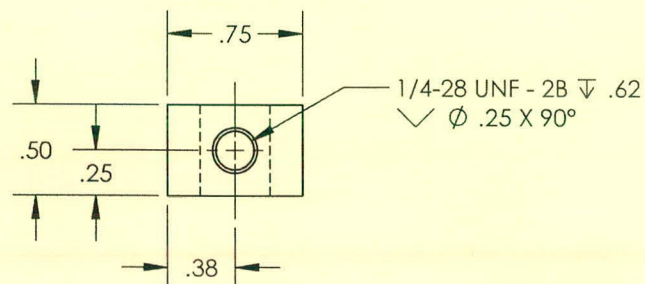
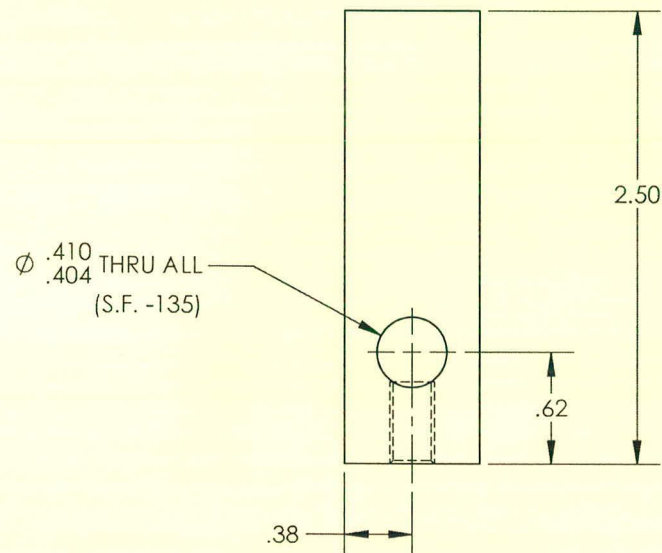
(-123)

PLUG

DART AEROSPACE	
TITLE UNIVERSAL HELICOPTER TOW BAR ASSY.	
DWG NO. RB T101808-123	REV 4
MAT'L 6061	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
HEAT TREAT	.XXX ± .010 FRACTIONS ± 1/8
FINISH SEE -107	.XX ± .03 ANGLES ± 1°
SPEC	.X ± .1 SURFACES = 125/✓
DRAWN BY: GILBERT	1. BREAK ALL SHARP EDGES .015 x 45° OR .015R
CHECKED: DUERFELDT	2. DIMENSIONAL LIMITS APPLY AFTER PLATING
OPPS APPR: ANDERSON	3. INTERPRET DIM AND TOL PER ASME Y14.5M-2009
QA APPR: LINDSAY	USED ON MODEL
APPROVED: GILBERT	BELL
SCALE 1:2	DATE 2/18/2014 SHEET 10 OF 16

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REVISIONS					
REV	ECR	DESCRIPTION	DATE	INITIAL	APPROVED
1	14-0194	-127 CH'D DIM WAS .50 IS (.50).	10/20/2014	DPD	JAG
3	16-0041	-127 CH'D DIM WAS (.50) IS .50, WAS Ø.390 THRU IS Ø.404-.410 THRU ALL S.F. -135.	2/18/2016	RJC	JAG
4	16-0131	-127 CH'D DIM WAS Ø.410/.404 THRU ALL S.F. -135 IS Ø.410/.404 THRU ALL (S.F. -135).	8/29/2016	DEW	SM



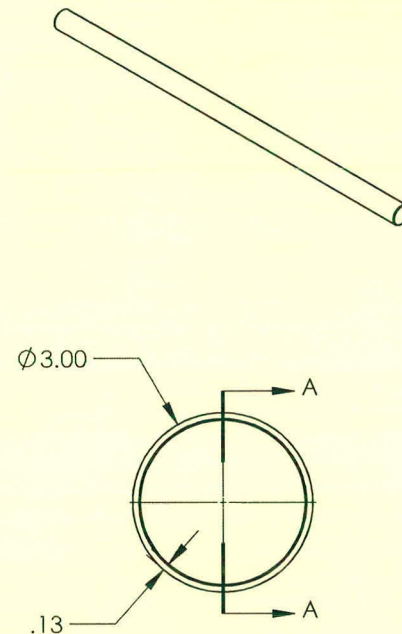
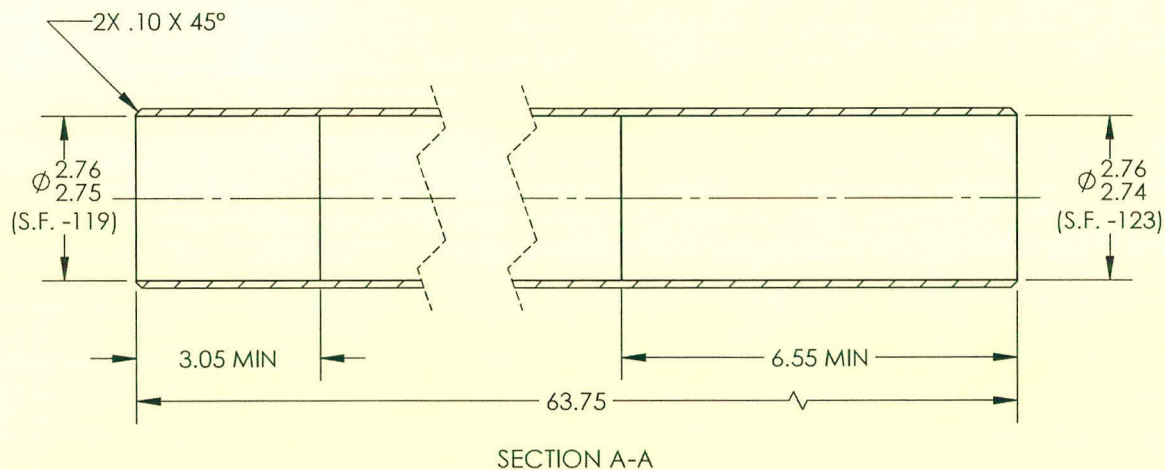
(-127)

HANDLE

DART AEROSPACE	
TITLE UNIVERSAL HELICOPTER TOW BAR ASSY.	
DWG NO. RB T101808-127	REV 4
MAT'L 304 S.S.	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
HEAT	.XXX ± .010 FRACTIONS ± 1/8
TREAT	.XX ± .03 ANGLES ± 1°
FINISH	.X ± .1 SURFACES = 125/✓
SPEC	1. BREAK ALL SHARP EDGES .015 x 45° OR .015R
DRAWN BY: CLOUGH	2. DIMENSIONAL LIMITS APPLY AFTER PLATING
CHECKED: DUERFELDT	3. INTERPRET DIM AND TOL PER ASME Y14.5M-2009
OPPS APPR: ANDERSON	USED ON MODEL
QA APPR: LINDSAY	BELL
APPROVED: GILBERT	
SCALE 1:1	DATE 2/18/2014 SHEET 11 OF 16

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REVISIONS					
REV	ECR	DESCRIPTION	DATE	INITIAL	APPROVED
3	16-0041	-129 DELETED Ø.500 AND Ø.515 HOLES, MOVED TO -107. ADDED DIMS 3.05 MIN, 6.55 MIN, Ø2.75-2.76 S.F. -119, Ø2.74-2.76 S.F. -123.	2/18/2016	RJC	JAG
4	16-0131	-129 CH'D DIM WAS Ø2.76/2.75 S.F. -119 IS Ø2.76/2.75 (S.F. -119), WAS Ø2.76/2.74 S.F. -123 IS Ø2.76/2.74 (S.F. -123).	8/29/2016	DEW	SM

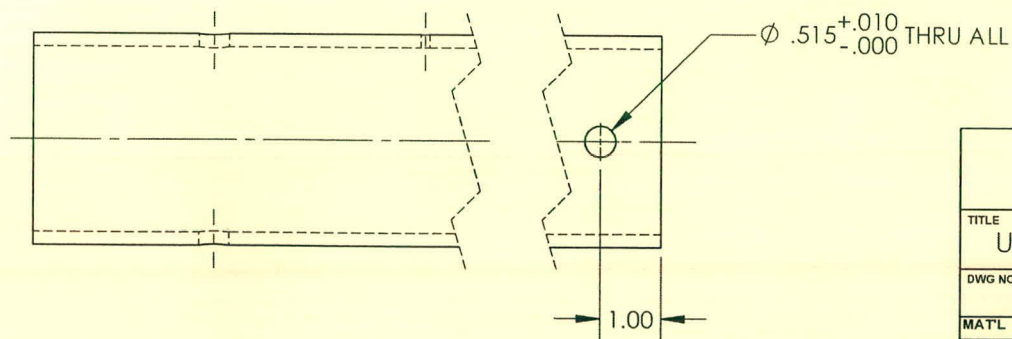
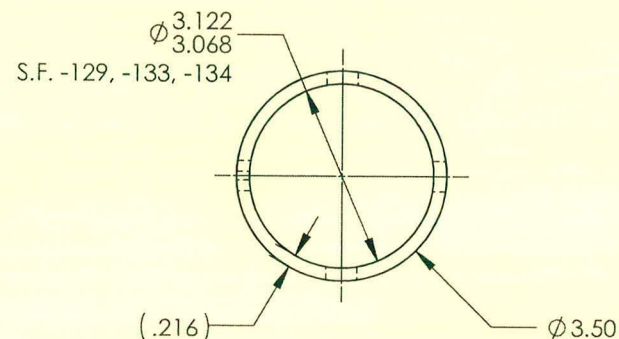
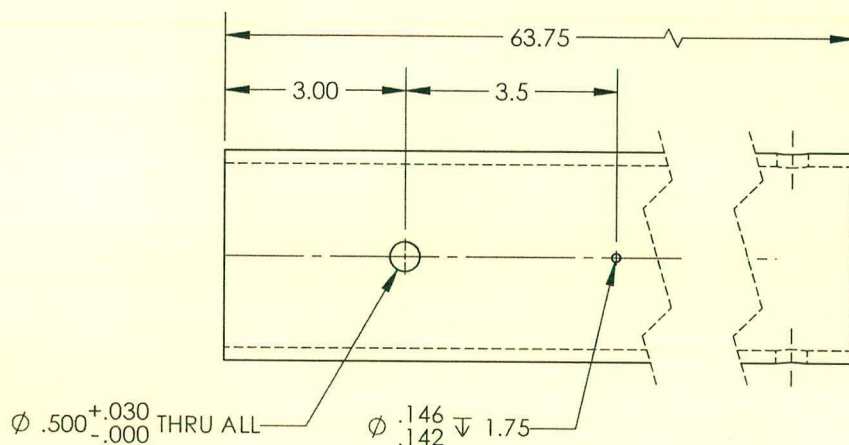


-129
INNER TUBE

DART AEROSPACE	
TITLE UNIVERSAL HELICOPTER TOW BAR ASSY.	
DWG NO. RB T101808-129	REV 4
MAT'L 6061	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
HEAT TREAT	.XXX ± .010 FRACTIONS ± 1/8
FINISH SEE -107	.XX ± .03 ANGLES ± 1°
SPEC	.X ± .1 SURFACES = 125/✓
DRAWN BY: GILBERT	1. BREAK ALL SHARP EDGES .015 X 45° OR .015R
CHECKED: DUERFELDT	2. DIMENSIONAL LIMITS APPLY AFTER PLATING
OPPS APPR: ANDERSON	3. INTERPRET DIM AND TOL PER ASME Y14.5M-2009
QA APPR: LINDSAY	USED ON MODEL
APPROVED: GILBERT	BELL
SCALE 1:3	DATE 2/18/2014
SHEET 12 OF 16	

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REVISIONS					
REV	ECR	DESCRIPTION	DATE	INITIAL	APPROVED
3	16-0041	-131 CHD DIMS WAS (Ø3.068) ENSURE S.F. -129 IS Ø3.122-3.068 S.F. -129 & -133, WAS Ø.092-.096 Ψ .22 IS Ø.142-.146 Ψ 1.75.	2/18/2016	RJC	JAG



(-131)

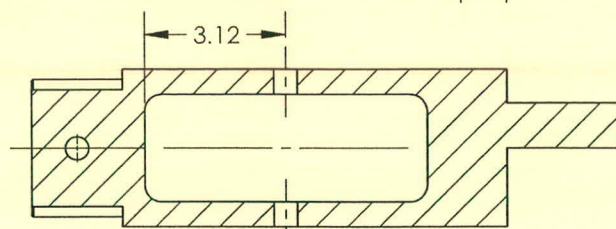
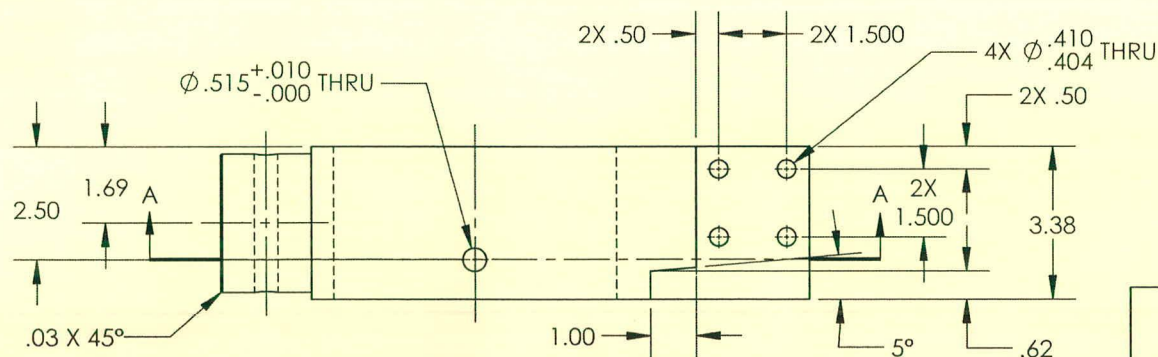
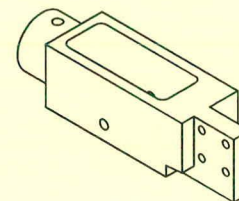
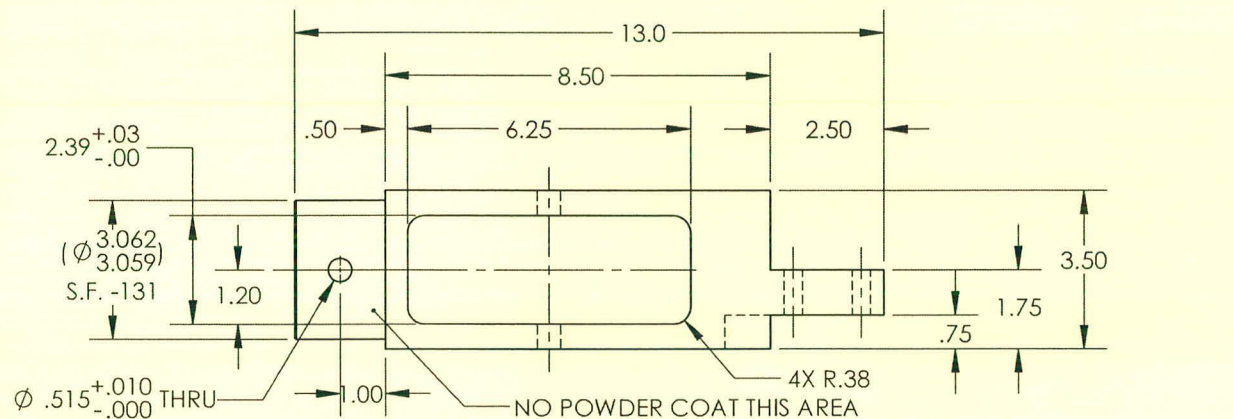
OUTER TUBE



TITLE		UNIVERSAL HELICOPTER TOW BAR ASSY.	
DWG NO.		RB T101808-131	REV 4
MAT'L 6061	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES .XXX ± .010 FRACTIONS ± 1/8 .XX ± .03 ANGLES ± 1° .X ± .1 SURFACES = 125/√		
HEAT TREAT			
FINISH POWDER COAT YELLOW			
SPEC FED #13538			
DRAWN BY: GILBERT	1. BREAK ALL SHARP EDGES .015 x 45° OR .015R 2. DIMENSIONAL LIMITS APPLY AFTER PLATING 3. INTERPRET DIM AND TOL PER ASME Y14.5M-2009		
CHECKED: DUERFELDT			
OPPS APPR: ANDERSON			
QA APPR: LINDSAY			
APPROVED: GILBERT	USED ON MODEL BELL		
SCALE 1:3	DATE 2/18/2014	SHEET 13 OF 16	

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REVISIONS				DATE	INITIAL	APPROVED
REV	ECR	DESCRIPTION				
1	14-0194	-133 CHD DIM WAS 3.50 IS (3.50).		10/20/2014	DPD	JAG
2	15-0026	-133 CHD DIMS WAS 4X R.25 IS 4X R.38, WAS .50 IS 2X .50, WAS 1.500 IS 2X 1.500, WAS .50 IS 2X .50, WAS 1.500 IS 2X 1.500.		1/30/2015	DPD	JAG
3	16-0041	-133 CHD DIM'S WAS 2.38 IS 2.39 +03-.00, WAS 1.19 IS 1.20, WAS (3.50) IS 3.50, WAS Ø3.060 IS Ø3.059-3.062 S.F. -131.		2/18/2016	RJC	JAG
4	16-0131	-133 CHD DIM WAS Ø3.062-3.059 S.F. -131 IS (Ø3.062-3.059) S.F. -131.		8/29/2016	DEW	SM



SECTION A-A

(-133)

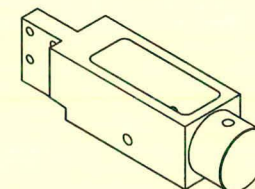
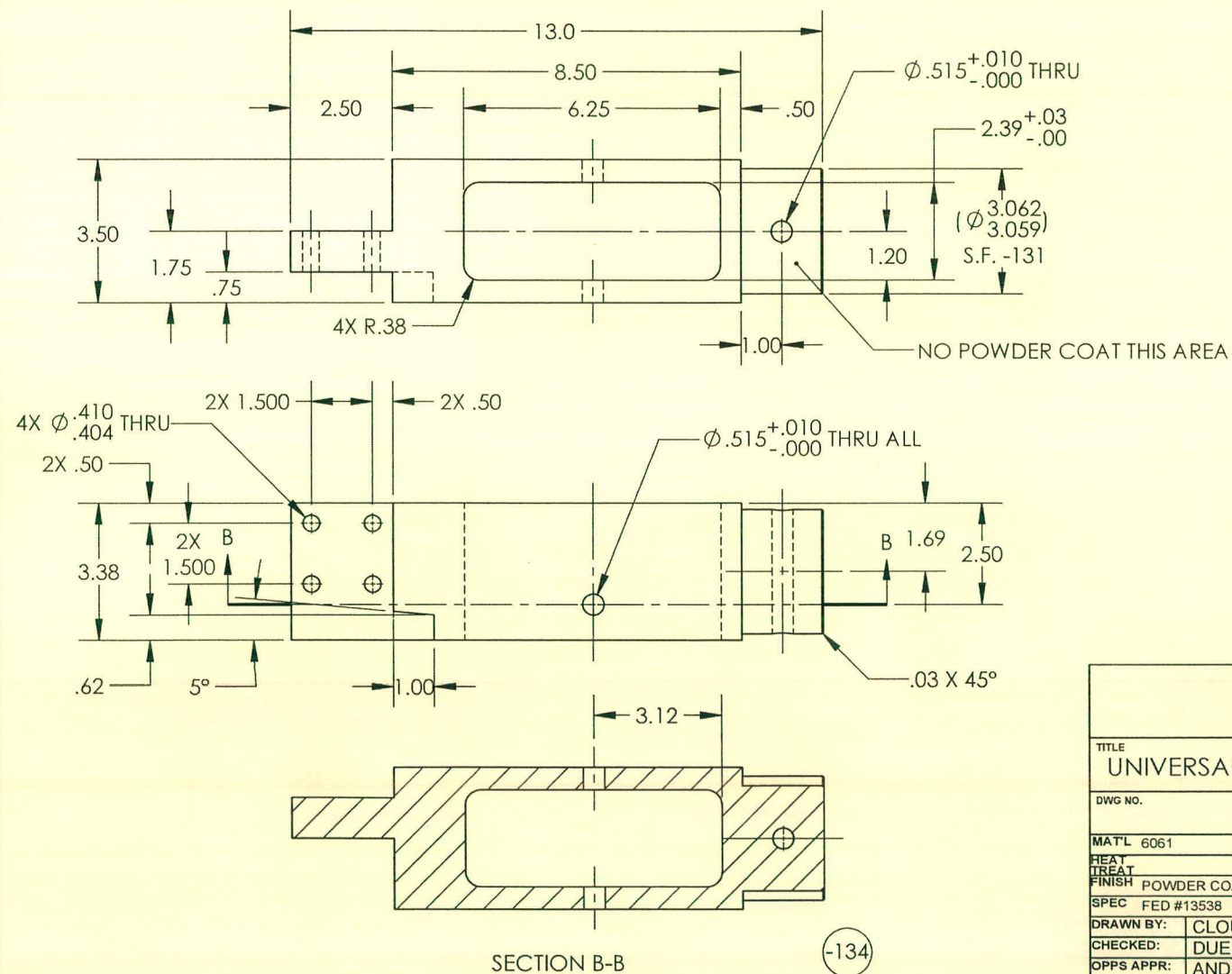
WHEEL BLOCK



TITLE		UNIVERSAL HELICOPTER TOW BAR ASSY.	
DWG NO.		RB T101808-133	
REV		4	
MAT'L 6061		UNLESS OTHERWISE SPECIFIED	
HEAT TREAT		DIMENSIONS ARE IN INCHES	
FINISH POWDER COAT YELLOW		.XXX ± .010 FRACTIONS ± 1/8	
SPEC FED #13538		.XX ± .03 ANGLES ± 1°	
DRAWN BY: CLOUGH		.X ± .1 SURFACES = 125/✓	
CHECKED: DUERFELDT		1. BREAK ALL SHARP EDGES	
OPPS APPR: ANDERSON		.015 X 45° OR .015R	
QA APPR: LINDSAY		2. DIMENSIONAL LIMITS APPLY AFTER PLATING	
APPROVED: GILBERT		3. INTERPRET DIM AND TOL PER ASME Y14.5M-2009	
SCALE 1:4		DATE 2/18/2014	
		SHEET 14 OF 16	

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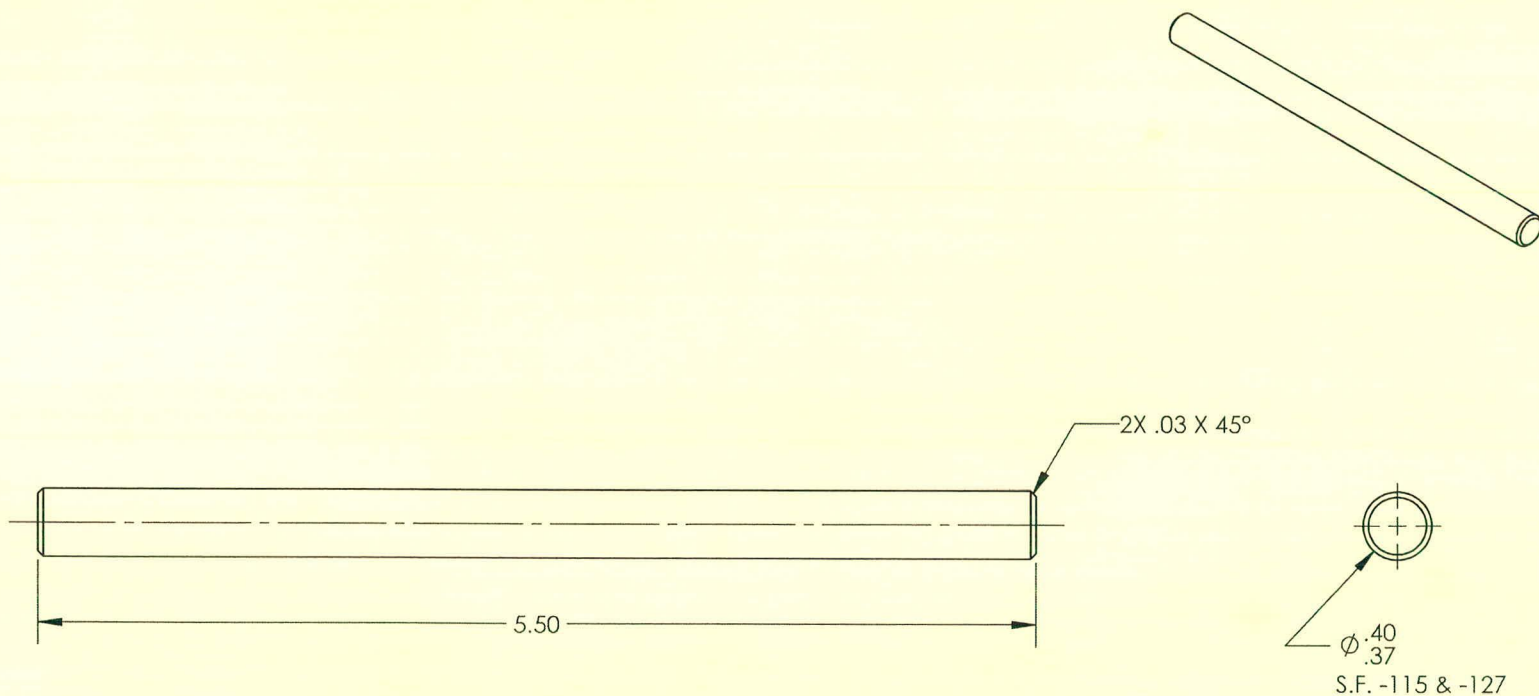
REVISIONS						
REV	ECR	DESCRIPTION	DATE	INITIAL	APPROVED	
2	15-0026	-134 CH'D DIMS WAS 4X R.25 IS 4X R.38, WAS .50 IS 2X .50, WAS 1.500 IS 2X 1.500, WAS .50 IS 2X .50, WAS 1.500 IS 2X 1.500.	1/30/2015	DPD	JAG	
3	16-0041	-134 CH'D DIM'S WAS 2.38 IS 2.39 +03-.00, WAS 1.19 IS 1.20, WAS (3.50) IS 3.50, WAS Ø3.060 IS Ø3.059-3.062 S.F. -131.	2/18/2016	RJC	JAG	
4	16-0131	-134 CH'D DIM WAS Ø3.062-3.059 S.F. -131 IS (Ø3.062-3.059) S.F. -131.	8/29/2016	DEW	JAG	



DART AEROSPACE	
TITLE UNIVERSAL HELICOPTER TOW BAR ASSY.	
DWG NO. RB T101808-134	REV 4
MAT'L 6061	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
HEAT TREAT	.XXX ± .010 FRACTIONS ± 1/8
FINISH POWDER COAT YELLOW	.XX ± .03 ANGLES ± 1°
SPEC FED #13538	.X ± .1 SURFACES = 125/✓
DRAWN BY: CLOUGH	1. BREAK ALL SHARP EDGES .015 X 45° OR .015R
CHECKED: DUERFELDT	2. DIMENSIONAL LIMITS APPLY AFTER PLATING
OPPS APPR: ANDERSON	3. INTERPRET DIM AND TOL PER ASME Y14.5M-2009
QA APPR: LINDSAY	USED ON MODEL
APPROVED: GILBERT	BELL
SCALE 1:4	DATE 2/18/2014
SHEET 15 OF 16	

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REVISIONS					
REV	ECR	DESCRIPTION	DATE	INITIAL	APPROVED
1	14-0194	-135 CH'D DIM WAS Ø.380 IS (Ø.380).	10/20/2014	DPD	JAG
3	16-0041	-135 CH'D DIM WAS (Ø.380) IS Ø.37-.40 S.F. -115 & -127.	2/18/2016	RJC	JAG



(-135)

PIN

DART AEROSPACE	
TITLE UNIVERSAL HELICOPTER TOW BAR ASSY.	
DWG NO. RB T101808-135	REV 4
MAT'L 303 S.S.	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
HEAT TREAT	.XXX ± .010 FRACTIONS ± 1/8
FINISH	.XX ± .03 ANGLES ± 1°
SPEC	.X ± .1 SURFACES = 125/✓
DRAWN BY: CLOUGH	1. BREAK ALL SHARP EDGES .015 X 45° OR .015R
CHECKED: DUERFELDT	2. DIMENSIONAL LIMITS APPLY AFTER PLATING
OPPS APPR: ANDERSON	3. INTERPRET DIM AND TOL PER ASME Y14.5M-2009
QA APPR: LINDSAY	USED ON MODEL
APPROVED: GILBERT	BELL
SCALE 1:1	DATE 2/18/2014 SHEET 16 OF 16

